EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview and email with Mark Watson on 10/30/08.

This examiner's amendment fixes a problem with claim 16.

The application has been amended as follows:

In the claims:

1-6 (Cancelled).

7 (Previously Presented). A system for computing a network code, comprising:

a network having a sender node, one or more interior nodes, and one or more receiver nodes, each node having one or more edges connecting to one or more interior nodes in the network;

means for computing a set of linear combination coefficients for each edge entering each node, each set of linear combination coefficients representing an encoding vector for each edge for encoding symbols transmitted along each corresponding edge;

wherein each symbol provides a symbolic representation of one or more encoded bits of data, and wherein each symbol belongs to a finite library of symbols;

means for computing a decoding vector for each edge exiting each interior network node from the linear combination coefficients of the edges entering each node, wherein each decoding vector is used for decoding symbols transmitted along each corresponding edge;

means for computing decoding matrices for each receiver node of the network from the decoding vectors; and

means for constructing a network code for at least a portion of the network, including the sender node, each interior node, and one or more of the receiver nodes, from the corresponding linear combination coefficients, the corresponding decoding vectors and the corresponding decoding matrices.

8 (Previously Presented). The system of claim 7 further comprising means for allowing each receiver node to use a corresponding one of the decoding matrices to decode data transmitted from the sender node, to the receiver node across a plurality of edges of the network between the sender node and the receiver node.

9 (Previously Presented). The system of claim 7 wherein computing the linear combination coefficients further includes means for ensuring that the encoding vectors for the symbols transmitted across edges on a cut between the sender and each receiver are full rank, such that the rank of each encoding vector is the same as the smallest dimension of that vector.

10-15 (Cancelled).

16 (Currently Amended). A computer-implemented process, including computer executable instructions stored on a physical computer-readable medium, for computing a network code for a network including at least one sender, a plurality of internal nodes and at least one receiver, comprising the steps of ~~using a computing device to~~:

computing ~~compute~~ a set of one or more linear combination coefficients for each interior network node and the at least one sender, wherein each set of linear combination coefficients represents a corresponding encoding vector for encoding symbols exiting a corresponding one of the sender and the internal nodes;

computing ~~compute~~ decoding vectors for symbols exiting each interior network node from the linear combination coefficients corresponding to each interior network node;

computing ~~compute~~ decoding matrices for each receiver from the decoding vectors of all internal nodes of the network; and

constructing ~~construct~~ a network code from the linear combination coefficients, the decoding vectors and the decoding matrices.

17 (Previously Presented). The computer-implemented process of claim 16 further comprising allowing each receiver to use a corresponding one of the decoding matrices to decode data transmitted across a path through one or more of the interior nodes between the at least one sender and the at least one receiver.

18 (Previously Presented). The computer-implemented process of claim 16 wherein computing the linear combination coefficients further includes ensuring that the encoding vectors for symbols transmitted across edges on a cut between the at least one sender and

each receiver are full rank, such that the rank of each encoding vector is the same as the smallest dimension of that vector.

19-22 (Cancelled).

23 (New). The system of claim 7 wherein a size of the finite library of symbols is independent of the rate of a rate of computed flows between the network nodes.

24 (New). The system of claim 7 further comprising an initialization stage performed prior to computing the set of linear combination coefficients, wherein a representation of the network is reduced to a network with edges between interior nodes having unit capacities by replacing each edge having a capacity c with c edges having unit capacity.

25 (New). The system of claim 24 wherein the initialization stage further comprises:

a determination of whether each edge having unit capacity is within flows computed between the sender node and the receiver nodes; and

topologically ordering any edges within the computed flows from the sender node to the one or more receiver nodes.

26 (New). The system of claim 25 wherein the topologically ordered edges are used for computing the sets of linear combination coefficients representing each encoding vector.

27 (New). The system of claim 25 wherein the topologically ordered edges are used for computing the decoding matrices.

28 (New). The computer-implemented process of claim 16 further comprising an initialization stage performed prior to computing the set of linear combination coefficients, wherein a representation of the network is reduced to a network with edges between interior nodes having unit capacities by replacing each edge having a capacity c with c edges having unit capacity.

29 (New). The computer-implemented process of claim 28 wherein the initialization stage further comprises:

a determination of whether each edge having unit capacity is within flows computed between the at least one sender and the at least one receiver; and

topologically ordering any edges within the computed flows from the at least one sender to the at least one receiver.

30 (New). The computer-implemented process of claim 29 wherein the topologically ordered edges are used for computing the sets of linear combination coefficients representing each encoding vector.

31 (New). The computer-implemented process of claim 29 wherein the topologically ordered edges are used for computing the decoding matrices.

REASONS FOR ALLOWANCE

The following is the examiner's statement of reasons for allowance:

Renumbered independent claims 1 and 9 among other things teach: constructing a network code for a sender, receiver and each interior nodes from a corresponding set of: a linear combination of coefficients representing an encoding vector for each edge for encoding symbols transmitted along each corresponding edge for each edge entering each node, wherein the symbol provides a symbolic representation of one or more encoded bits of data and each symbol belongs to a finite library of symbols; a decoding vector for each edge exiting each interior node from the linear combination of coefficients; and a decoding matrices for each receiver node of the network from the decoding vectors in a computer network environment.

The prior art does not teach the cited limitation.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

CORRESPONDANCE INFORMATION

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Benjamin R. Bruckart whose telephone number is (571) 272-

3982. The examiner can normally be reached on 9:00-5:30PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeff Pwu can be reached on (571) 272-6798. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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